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EXAMINER	
PATEL, SHAMBHAVI K	
ART UNIT	PAPER NUMBER
2128	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/699,576	KERNER ET AL.	
	Examiner	Art Unit	
	SHAMBHAVI PATEL	2128	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 January 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. A **request for continued examination** under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 28 January 2009 has been entered.

2. Claims 1-29 have been presented for examination.

Response to Arguments

3. Applicant's arguments with respect to claims 1-29 have been considered but are moot in view of the new ground(s) of rejection.

Claim Objections

4. **Claim 29** is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 1 recites a tangible medium, and as per the specification, a tangible medium is defined as tangible media including floppy disks, removable hard disks, optical storage media such as CD-ROMS and bar codes, semiconductor memories such as flash memories, read-only-memories (ROMS), battery-backed volatile memories, networked storage devices, and the like. Claim 29 duplicates this definition and does not further limit claim 1.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. **Claims 11 and 17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite** for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Regarding **claim 11,** the phrase "beam strength of land based laser devices" is vague and indefinite. Regarding **claim 17,** the phrase "missile thread cloud" is vague and indefinite.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in Graham v. John Deere Co., 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1-5, 7-10, 12, 14-16, 18-25 and 27-29 are rejected under 35 U.S.C. 102(a) as being anticipated by **Slambrook ("Three Dimensional Visualization to Support Command and Control")** in view of **Leibe ("The Perceptive Workbench: Toward Spontaneous and Natural Interaction in Semi-Immersive Virtual Environments").**

Regarding claims 1 and 27:

Slambrook discloses a visualization system for developing a three-dimensional representation of a space system comprising a processor comprising:

a. a positioning portion configured to determine a position of a viewer with respect to a real world **(section 2.3.2 input sensors detect head position)** and a position of the viewer with respect to a

virtual world **(section 2.3.2 head position used to determine perspective in virtual world)**, the positioning portion configured to allow the viewer to interact with the virtual world **(figure 2)**

b. a modeling portion configured to specify the virtual world in response to a space system model of the virtual world **(section 2.3.5.2; figure 2),** the space system model including models for the earth and satellites **(section 4)**

c. a model specification portion configured to specify a representation of satellite status data of the satellites in response to the position of the viewer with respect to the virtual world and in response to the satellite status data of the satellites **(section 2.3.5.2; section 4; figure 2)**

d. an output portion configured to provide a three dimensional representation of a space system **(title)**, the three-dimensional representation of the space system including an image of the virtual super-imposed on an image of the real world **(section 2.3.3),** the image of the virtual world including the representation of the satellite model status data of the satellites to the viewer in response to the position of the viewer with respect to the virtual world **(sections 2.3.2 and 4),** the representation of the satellite model status data of the satellites including a three-dimensional representation of satellite orbits **(figure 4)**, the image of the virtual world including a three-dimensional representation **(title)** of the models for the earth and the satellites **(figures 3 and 4).**

e. wherein the representation of the satellite data of the satellites further comprises a representation selected from the group: satellite sensor orientation, satellite sensor position, and satellite system design data **(section 4; figures 4 and 5).**

f. an input portion configured to allow the viewer to select a satellite to view satellite model status data of the satellite **(section 4)** and configured to allow the viewer to move the satellite to a different position **(sections 1.1 and 2.2)**

Regarding **claim 27**, the "object" in this claim is equivalent to the "satellite" in claim 1.

Slambrook does not explicitly disclose superimposing a view of the virtual world on an image of the real-world as seen by the viewer. **Leibe teaches** superimposing a view of the virtual world (specifically, a 3D model of the planet) on an image of the real-world as seen by the viewer **("3D Terrain Navigation"; figure 7).** At the time of

the invention, it would have been obvious to one of ordinary skill in the art to combine the teachings of Slambrook and Leibe to use a detailed and compelling navigation **(Leibe: "3D Terrain Navigation").**

Regarding claims 2, 9 and 16:

Slambrook teaches an augmented reality system including:

a. an image acquisition source configured to capture at least an image comprising an image of the real world **(section 2.2)**, and an image of at least a pre-determined marker positioned in the real world **(section 1.1)**

b. wherein the positioning portion comprises:

i. an image processing portion configured to determine the position of the viewer with respect to the read world in response to the image of the pre-determined marker **(sections 1.1 and 2.3.3)**

ii. virtual positioning portion configured to translate the position of the viewer in the real world to the position of the viewer in the virtual world **(section 2.3.2)**

Regarding claims 3 and 10:

Slambrook discloses the visualization system of claim 1 wherein the model of the virtual world is a multi-dimensional model of the virtual world **(title)** and the output portion in a multi-dimensional output portion **(title; section 1.1).**

Regarding claims 4 and 28:

Slambrook discloses the visualization system of claim 1 wherein the representation of the satellite model status data comprises a representation of the current position, coverage analysis, communication link and satellite systems status **(section 4).**

Regarding claims 5, 12 and 18:

Slambrook discloses the visualization system of claim 1 wherein the three-dimensional output portion comprises a heads-up pair of glasses **(table 1).**

Regarding claims 7 and 14:

Slambrook discloses the visualization system of claim 5 wherein the heads-up pair of glasses are also configured to allow the viewer to view the image of the virtual world super-imposed on the image of the real world **(section 2.2).**

Regarding claim 8:

Slambrook discloses a method for visualization of augmented reality to develop a three-dimensional representation of a space system, the method comprising:

a. determine a position of a viewer with respect to a real world **(section 2.3.2 input sensors detect head position)** and a position of the viewer with respect to a virtual world **(section 2.3.2 head position used to determine perspective in virtual world)**, the positioning portion configured to allow the viewer to interact with the virtual world **(figure 2)**

b. determining a space system model of the virtual world **(section 2.3.5.2; figure 2),** the space system model including models for the earth and satellites **(section 4)**

c. determining a representation of satellite model status data of the satellites in response to the position of the viewer with respect to the virtual world and in response to the satellite model status data of the satellites **(section 2.3.5.2; section 4; figure 2)**

d. displaying to the viewer a three dimensional representation **(title)** of a space system, the three-dimensional representation of the space system including a representation of the virtual world super-imposed on a representation of the real world **(sections 2.2 and 2.3.3),** the representation of the virtual world including the representation of the satellite status data of the satellites in response to the position of the viewer with respect to the virtual world **(section 4),** the representation of the satellite model status data of the satellites including a three-dimensional representation of satellite

orbits **(figure 4)**, the image of the virtual world including a three-dimensional representation of the models for the earth and the satellites **(figures 3 and 4)**

e. selecting one of the satellites, by the viewer, to view satellite model status data of the selected one of the satellites **(section 4)**

f. moving the selected one of the satellites, by the viewer, to a different position **(sections 1.1 and 2.2).**

g. wherein the representation of the satellite data further comprises a representation selected from the group: satellite sensor orientation, satellite sensor position, and satellite system design data **(section 4; figures 4 and 5).**

Slambrook does not explicitly disclose superimposing a view of the virtual world on an image of the real-world as seen by the viewer. **Leibe teaches** superimposing a view of the virtual world (specifically, a 3D model of the planet) on an image of the real-world as seen by the viewer **("3D Terrain Navigation"; figure 7).** At the time of the invention, it would have been obvious to one of ordinary skill in the art to combine the teachings of Slambrook and Leibe to use a detailed and compelling navigation **(Leibe: "3D Terrain Navigation").**

Regarding claim 15:

Slambrook discloses a visualization method for developing a three-dimensional representation of a space system comprising:

a. determining a space system model of a virtual world **(sections 2.2 and 2.3.5.2; figure 4)**, the space system model including models for the earth and satellites **(section 4)**

b. determining a representation of satellite model status data of the satellites in response to satellite model status data of the satellites and in response to a position of a viewer with respect to the virtual world **(section 2.3.5.2; section 4; figure 2)**

c. determining a representation of the virtual world in response to the space system model of the virtual world and in response to a position of the viewer with respect to the virtual world **(section 2.3.5.2; section 4; figure 2)**

d. displaying to the viewer a three-dimensional representation of a space system **(title)**, the representation of the space system including a representation of a real world overlaid with the representation of a virtual world **(sections 2.2 and 2.3.3),** the representation of the virtual world including the representation of the satellite model status data of the satellites **(section 4),** the representation of the satellite model status data of the satellites including a three-dimensional representation of satellite orbits **(figure 4)**, the image of the virtual world including a three-dimensional representation of the models for the earth and the satellites **(title; section 4)**

e. selecting one of the satellites, by the viewer, to view satellite model status data of the satellite **(section 2.3.5.1)**

f. moving the selected one of the satellites, by the viewer, to a different position **(section 1.1 and 2.2)**

g. wherein the viewer is allowed to interact with the virtual world **(section 1.1; figure 2)**

Slambrook does not explicitly disclose superimposing a view of the virtual world on an image of the real-world as seen by the viewer. **Leibe teaches** superimposing a view of the virtual world (specifically, a 3D model of the planet) on an image of the real-world as seen by the viewer **("3D Terrain Navigation"; figure 7).** At the time of the invention, it would have been obvious to one of ordinary skill in the art to combine the teachings of Slambrook and Leibe to use a detailed and compelling navigation **(Leibe: "3D Terrain Navigation").**

Regarding claim 19:

Slambrook teaches an augmented reality system including displaying to the viewer a portion of the virtual selected by the viewer wherein the viewer selection is determined in response to a position of the a viewer-controlled marker with respect to the virtual world, wherein the marker is positioned in the real world **(sections 1.1 and 2.3.2).**

Regarding claim 20:

Slambrook discloses the visualization method of claim 19, wherein the step of displaying to the viewer the portion of the virtual world selected by the viewer comprises overlaying an icon over the portion of the virtual world displayed to the viewer **(sections 1.1 and 2.2).**

Regarding claims 21-23:

Slambrook discloses providing the representation of the real world and the virtual world (and super-imposing the virtual world on the real world) in real time **(section 2.2).**

Regarding claim 24:

Slambrook discloses allowing the viewer to select a satellite or geographic area **(section 1.1).**

Regarding claim 25:

Slambrook discloses allowing the viewer to directly select and manipulate objects in the virtual world without using a mouse **(section 1.1).**

Regarding claim 29:

Slambrook discloses tangible medium for storing the software **(inherent).**

7. **Claims 6, 13 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Slambrook ("Three Dimensional Visualization to Support Command and Control")** in view of **Leibe ("The Perceptive Workbench: Toward Spontaneous and Natural Interaction in Semi-Immersive Virtual Environments")** in view of **Kato ("Virtual Object Manipulation on a Table-Top AR Environment",** 2000**).**

Regarding claims 6 and 13:

Slambrook does not explicitly disclose allowing more than one user to interact with the image. **Kato teaches** the visualization system of claim 1 configured to allow more than one user to interact with the image of the virtual world at the same time and is configured to allow the more than one user to collaborate with each other while

viewing from different positions **(section 2.1).** At the time of the invention, it would have been obvious to one of ordinary skill in the arts to combine the teachings of Slambrook, Leibe and Kato because the interface of Kato provides accurate tracking and registration techniques and an intuitive and useful interface **(Kato: abstract).**

Regarding claim 26:

Slambrook does not explicitly disclose the use of pre-determined markers in the real world. **Kato teaches** an augmented reality system including a marker positioned in the real world, the marker is static or placed upon a paddle that included a pre-defined visual marker in the real world, and the paddle is capable of being moved around the real world **(Kato: sections 3 and 4).** At the time of the invention, it would have been obvious to one of ordinary skill in the arts to combine the teachings of Slambrook and Kato because the interface of Kato provides accurate tracking and registration techniques and an intuitive and useful interface **(Kato: abstract).**

8. Claim 11 is rejected under 35 U.S.C. 102(a) as being anticipated by **Slambrook ("Three Dimensional Visualization to Support Command and Control")** in view of **Leibe ("The Perceptive Workbench: Toward Spontaneous and Natural Interaction in Semi-Immersive Virtual Environments")** in view of **Nikulin ("Modeling of an Acousto-Optic Laser Beam Steering System Intended for Satellite Communication").**

Regarding claim 11:

Leibe discloses an image of the real world as being seen by the viewer being an image of a real world stage as being seen by the viewer **("3D Terrain Navigation"; figure 7). Slambrook and Leibe do not explicitly disclose** displaying beam strength of land based laser devices. **Nikulin teaches** modeling beam strength of land based laser devices when doing satellite communication modeling **(section 4, equation 7).** At the time of the invention it would have been obvious to one of ordinary skill in the art to combine the teachings of Slambrook, Leibe and Nikulin in order to fully model the entire satellite system **(Nikulin: Conclusion).**

9. Claim 17 is rejected under 35 U.S.C. 102(a) as being anticipated by **Slambrook ("Three Dimensional Visualization to Support Command and Control")** in view of **Leibe ("The Perceptive Workbench: Toward**

Spontaneous and Natural Interaction in Semi-Immersive Virtual Environments") in view of **Barnhart ("Development and Application of an Object-Oriented Graphical Environment for the Simulation of Space-Based Sensing Systems").**

Regarding claim 17:

Leibe discloses an image of the real world as being seen by the viewer being an image of a real world stage as being seen by the viewer **("3D Terrain Navigation"; figure 7). Slambrook and Leibe do not explicitly disclose** displaying missile thread clouds. **Barnhart teaches** modeling satellites along with missile defense clouds beam strength of land based laser devices when doing satellite communication modeling **("System Level Architecture and Performance Analysis"; figure 6)).** At the time of the invention it would have been obvious to one of ordinary skill in the art to combine the teachings of Slambrook, Leibe and Barnhart in order to utilize a paradigm that provides an environment suitable for establishing flexibility, rapid reconfiguration of new architectures and integration of new modes **(Barnhart: Abstract).**

Conclusion

10. **Examiner's Remarks:** Examiner has cited particular columns and line numbers in the references applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings of the art and are applied to specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant in preparing responses, to fully consider the references in their entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the Examiner. In the case of amending the claimed invention, Applicant is respectfully requested to indicate the portion(s) of the specification which dictate(s) the structure relied on for proper interpretation and also to verify and ascertain the metes and bounds of the claimed invention.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shambhavi Patel whose telephone number is (571) 272-5877. The examiner can normally be reached on Monday-Friday, 8:00 am – 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamini Shah can be reached on (571) 272-2279. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SKP

/Kamini S Shah/
Supervisory Patent Examiner, Art Unit 2128